

# The impact of organised educational campaigns on understanding of needle sticks injuries and related post-exposure HIV/AIDS prophylaxis

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## ABSTRACT

**Background:** For those who often use needles, such as nurses and laboratory professionals, needle stick injuries are a fact of life. Even if it's not medical waste, it can still happen if you touch garbage. Approximately 385,000 healthcare professionals stab themselves unintentionally each year. The likelihood of virus transmission after a skin puncture injury depends on the person who used the object in the first place, the quantity of blood involved, the type of needle or syringe in question, the length of time since it was last used, and the type of injury. Post-exposure prophylaxis should be taken into account. **Objective:** The objective of the study is to assess the impact of a structured educational campaign on nursing students' understanding of needle stick injuries and related post-exposure prophylaxis for HIV/AIDS. **Methodology:** Quasi experimental research design was used. Sixty nursing students B.Sc (N) and GNM (N) 1<sup>st</sup> year students were selected by using purposive sampling technique. The study was conducted at selected private nursing colleges at District Kangra, Himachal Pradesh. **Results:** In the pre-test knowledge score, (25%) nursing students had poor level of knowledge, (66.66%) nursing students had average level of knowledge, and (8.34%) nursing students had good level of knowledge. The post-test knowledge score (43.34%) nursing students had good level of knowledge, (56.66%) nursing students had average level of knowledge, and (0%) nursing students had poor level of knowledge. The t value in the group was 9.50 which were highly significant at  $P < 0.05$  level. **Conclusion:** Compared to video-assisted instruction, the lecture and demonstration technique is more successful. The fact that both teaching techniques contribute to improving understanding of HIV/AIDS and needle stick injuries.

**Keywords:** Educational campaigns, HIV/AIDS, needle sticks injuries, prophylaxis

## Introduction

Needle stick injuries (NSIs) pose a substantial occupational risk to healthcare professionals worldwide. These inadvertent exposures to contaminated needles or sharp objects can lead to the transmission of blood-borne pathogens, including

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Received: 17-06-2023

Revised: 28-09-2023

Accepted: 24-09-2024

Published: 13-01-2025

### Access this article online

Quick Response Code:



Website:

<http://journals.lww.com/JFMPC>

DOI:

10.4103/jfmprc.jfmprc\_1001\_23

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**How to cite this article:** Garg RK, Koundal P, Sharma P, Kumar Y, Niwas R, Singh J. The impact of organised educational campaigns on understanding of needle sticks injuries and related post-exposure HIV/AIDS prophylaxis. J Family Med Prim Care 2025;14:395-400.

HIV (Human Immunodeficiency Virus), which causes AIDS (Acquired Immunodeficiency Syndrome). While NSIs are preventable, they continue to be a prevalent concern in healthcare settings, emphasizing the need for comprehensive educational initiatives to enhance healthcare workers' knowledge and preparedness in managing such incidents.<sup>[1]</sup>

Healthcare professionals, including nurses, physicians, laboratory technicians, and paramedical staff, frequently encounter needles and sharps in their daily routines. Despite stringent safety protocols and precautions, NSIs persist with potential consequences that extend beyond the physical health of those affected. The psychological and emotional toll of such incidents can be significant, leading to stress, anxiety, and fears of potential infection.<sup>[2]</sup>

Recognizing the gravity of NSIs in healthcare and their implications for both the affected individuals and the broader healthcare system, organized educational campaigns have emerged as a critical strategy for mitigating these risks. These campaigns aim to equip healthcare professionals with the knowledge and skills necessary to prevent NSIs, promptly respond to such incidents when they occur, and make informed decisions regarding post-exposure HIV/AIDS prophylaxis.<sup>[3]</sup>

This article explores the impact of organized educational campaigns on the understanding of NSIs and related post-exposure HIV/AIDS prophylaxis among healthcare professionals. It delves into the effectiveness of these campaigns in bridging knowledge gaps, changing behaviours, and ultimately enhancing the safety of healthcare workers in the face of NSIs. By examining the outcomes of such initiatives, we aim to contribute valuable insights that can inform future strategies for safeguarding the well-being of those at the frontline of healthcare delivery.

A needle stick injury (NSI) is a non-intentional skin-piercing stab wound brought on by a hollow bore needle (or other sharp) carrying someone else's blood or body fluid. Sharps injury (SI) is defined as a skin-piercing stab wound that occurs as a result of occurrences using sharp instruments in a medical setting. Due to the frequent use of sharp instruments, the presence of blood and saliva, the diversity of bacterial flora in the oral cavity, blood-borne infections are a danger in dental offices. There is a problem with NSI prevention in practically every medical setting. The burden of NSIs and SIs in a dental workplace can be reduced when a dental professional adheres to the most recent, widely accepted standard preventative measures against NSIs. Every healthcare institution should have a functioning hospital infection control committee and an infection control programme in place.<sup>[4]</sup>

Approximately 2.40 million Indians (1.93-3.04 million) are estimated to be HIV-positive as of 2009, with an adult prevalence rate of 0.31%. Adults under the age of 15 are affected by 3.5% of infections, whereas adults between the ages of 15 and 49 are affected by 83% of diseases. Women make up about 39% (930,000) of HIV infections. Only a few states in the developed south, west, and northeast contain the majority of

India's extremely diverse ethnicities. The four high prevalence states of South India, Andhra Pradesh (500,000 cases), Maharashtra (420,000 cases), Karnataka (250,00 cases), and Tamil Nadu (150,00 cases), account for 55% of all HIV infections in the country. Estimates indicate that over 100,000 PLHA are present in West Bengal, Gujarat, Bihar, and Uttar Pradesh, accounting for an extra 22% of HIV infections in India.<sup>[5]</sup>

Injuries brought on by needles used in medical procedures are often known as sharps or needle stick injuries. Sharps include things like lancets, scalpels, and other medical supplies, as well as broken glass from broken machinery. Blood can get infected with viruses like hepatitis B and C after someone uses a needle. Included in this are needles used to inject illegal substances. Sharps can become blood-contaminated (Canadian Centre for Occupational Health and Safety, Diseases, Disorders and Injuries, Needle stick and Sharps Injuries).<sup>[6]</sup>

The risk of viral transmission following a skin puncture injury is influenced by the user of the instrument, the amount of blood involved, the type of needle or syringe in issue, the period since it was last used, and the type of damage. PEP, or post-exposure prophylaxis, needs to be considered. PEP is said to be more than 80% effective at lowering the chance of getting stuck with a needle. Additionally, there is another PEP kind that can guard against hepatitis B.<sup>[7]</sup>

A cross-sectional study was conducted to assess knowledge, attitude, and practice of PEP for HIV among nurses in Bhutan among 221 registered nurses working at Jigme Dorji Wangchuck National Referral Hospital, Bhutan. The majority of participants (80.1%) had little awareness about PEP for HIV. Only three (1.4%) of our participants—out of the 50.1% who had heard of PEP—had actually gone to a formal HIV PEP course. However, a sizable percentage of nurses (92.3%) expressed a favourable outlook on PEP for HIV. 95 (43%) of the 221 responders have experienced needle stick wounds and blood or body fluid splashes while handling patients. Only 2 (2.1%) of them, despite a considerable number of exposures, took PEP and finished the prescribed 28-day prophylaxis. Major reported reasons of exposure among survey participants included a lack of protective barriers at the workplace (56.8%) and inadequate understanding of personal protective equipment (14.7%). Two key factors that contributed to the failure of PEP practice among exposed persons were the absence of PEP services (30.2%) and a lack of support for reporting events (22.6%). Despite the majority of our respondents having a favourable attitude, nurses had very little understanding of and practice with PEP for HIV. To increase nurses' general understanding of and use of PEP against HIV, formal PEP training and a 24-hour PEP service with appropriate criteria are advised.<sup>[8]</sup>

A descriptive cross-sectional study was conducted on healthcare workers actively treating patients enrolled from 18 health facilities in Singida District Council. The study's findings indicate that, of the 239 participants, 124 (or 52%) knew too little overall about HIV PEP. 121 (50.6%) of the 239 individuals had occupational

exposure. Blood splash exposure (57; 47.1%) and needle stick exposure (45; 37.2%) were the two most common kinds of exposure. Among the 121 individuals who had been exposed, 83 (68.6%) had disclosed the exposure event, 91 (75.2%) had undergone an HIV test, 32 (26.4%) had begun HIV PEP following the test, 28 (23.1%) had finished HIV PEP, and 65 (53.7%) had undergone a follow-up HIV test. Forty-nine people (20.5%) said they had daily access to HIV PEP services, making up around two-thirds (159/239) of the participants who said the services were available at the time the survey was done. Therefore, it may be said that there is a high incidence of occupational exposure among healthcare personnel and poor uptake of HIV PEP. Most healthcare professionals lack appropriate understanding about HIV PEP. The results show that there is a need to increase this at-risk group's understanding about HIV PEP and PEP use in Singida.<sup>[9]</sup>

## Research Approach and Research Design

Quantitative Research Approach and Quasi Experimental Research Design (One group pre-test—post-test design) were adopted. The study was conducted in selected private nursing colleges of District Kangra, Himachal Pradesh. Two hypotheses were adopted. H1: There was a significant difference between the pre-test and post-test knowledge scores of nursing students regarding needle stick injury and its post-exposure prophylaxis of HIV/AIDS. H2: There was a significant association of pre-test level of knowledge with the selected socio-demographic variables of nursing student. In the present study, the sample size was 60 nursing students of selected nursing colleges of District Kangra, Himachal Pradesh, and non-probability purposive sampling technique was adopted to select the subset of population. The sample selection inclusion criteria were nursing students who were able to communicate in English, Hindi, and local language; students who were willing to participate in the study, and the study included only nursing students.

## Sample selection exclusion criteria

- Nursing students who were not present at the time of data collection
- Nursing students who were unwilling to participate in the study
- Students from Government nursing colleges
- Students from colleges outside of District Kangra.

## Study delimitations

- Sample size limited to 60 nursing students
- Only selected nursing colleges within District Kangra were included
- Institutional ethical clearance was obtained
- Informed consent was taken from all respondents.

## Description of tool

The tool was constructed to assess the knowledge of nursing students regarding needle stick injury and HIV/AIDS. The review

of literature that is books, internet, investigators experience, and expert's opinions provided basis for the construction of the tools.

**Development Of Tool I:** A socio-demographic profile tool—II: A self-structured knowledge questionnaire regarding needle stick injury and HIV/AIDS

**Description Of Tool Section I:** This tool includes demographic variables consisting of items like age, religion, educational status, type of family, number of friends, and previous knowledge.

**Self-structured knowledge questionnaires Section II:** This tool consists of 30 questions to assess the knowledge of nursing students regarding needle stick injury and HIV/AIDS. The questionnaires were developed for the respondents to respond by choosing one option out of four options.

Scoring Criteria of Structured Knowledge Questionnaires: Knowledge regarding selected nursing students of nursing college was scored as follows:

Table 1 shows level of knowledge of nursing students, and those who have obtained 00–10 are considered poor knowledge,

**Table 1: Scoring criteria of structured knowledge questionnaires**

Level of Knowledge	Score Range
00–10	Poor
11–20	Average
21–30	Good

**Table 2: Frequency (f) and percentage (%) distribution of nursing students according to their socio-demographic variables n=60**

Demographic variables	Frequency	Percentage
Age (in years)		
18-21	05	8.33%
22-25	42	70%
26-29	13	21.66%
Religion		
Hindu	60	100%
Residential Status		
Urban	26	43.34%
Rural	34	56.66%
Education Qualification		
BSc Nursing	20	33.34%
GNM	40	66.66%
Previous Knowledge about needle stick injuries and their post-exposure prophylaxis for HIV/AIDS		
Yes	23	38.33%
No	37	61.67%
If yes, source of information		
Mass Media	11	47.82%
Friends	03	13.04%
Book	09	39.13%

11–20 represents average knowledge, and 21–30 represents good knowledge regarding needle stick injury and HIV/AIDS.

## Reliability

Karl Pearson correlation coefficient was used to calculate the value of reliability. The value of  $r$  was found to be 0.7. Based on the statistical criteria, the tool was considered as reliable. The acceptable range of  $r$  value is between 0.6 and 0.9. Hence, the tool was reliable.

## Results

Table 2 shows the distribution of nursing students according to the sample characteristics like age (in years), religion, residential status, education status, any previous knowledge regarding needle stick injury and if yes source of information. It was depicted that according to age (In years), (8.33%) nursing students belong to the age group of 18-21 years, (70%) belong to the age group of 22- 25 years, (21.67%) belong to the 26-39 years and (0%) belong to the age group of >30 years. As per religion, (100%) were Hindu Distributions of nursing students according to their residential status (43.34%) were from urban areas and (56.66%) were from rural areas. In relation to educational status, (33.34%) were from BSc Nursing and (66.66%) were from GNM. According to previous knowledge, (38.33%) had no previous knowledge and (61.67%) had previous knowledge. As per source of information, (47.82%) were Mass Media, (13.04%) were Friends, (00%) were Family, and (39.13%) were Books.

Data presented in Figure 1 shows in that the pre-test knowledge score, (25%) nursing students had poor level of knowledge, (66.66%) nursing students had average level of knowledge and (8.34%) nursing students had good level of knowledge.

Data presented in Figure 2 shows that in post-test knowledge score was categorized in poor, average and good. The post-test knowledge score (43.34%) nursing students had good level

of knowledge, (56.66%) nursing students had average level of knowledge and (0%) nursing students had poor level of knowledge.

The analysis of Table 3 shows the comparison of mean pre-test and post-test knowledge score regarding needle stick injury and its post-exposure prophylaxis of HIV/AIDS among nursing students. The mean post-test knowledge score was higher than the mean pre-test knowledge score, i.e., the mean post-test was (21.28) and mean pre-test was (12.34). Further, the paired  $t$ -test was used to find the significant difference between the mean pre-test and post-test knowledge scores. The  $t$ -value was 9.50, which was highly significant at a level of  $*P < 0.05$ . This indicates that the results were statistically significant.

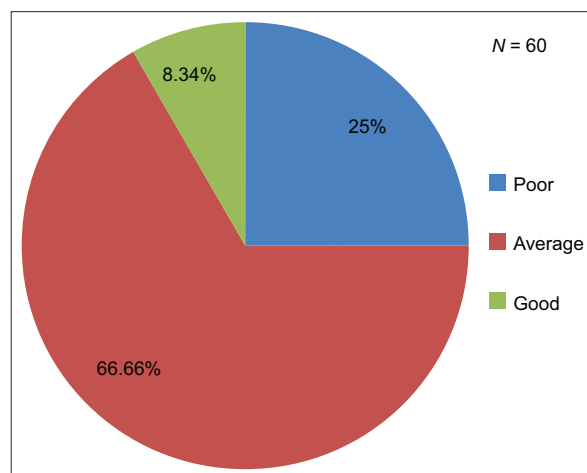
Hence, the alternative hypothesis (H1) was accepted. It was concluded that the mean post-test knowledge score was high as compared to mean pre-test knowledge score and that difference is due to the exposure of Structured Teaching Program to nursing students regarding needle stick injury and its post-exposure prophylaxis of HIV/AIDS.

Table 4 shows association of demographic variables with pre-test knowledge score. There were no associations found with socio-demographic variables such as age (in years), religion, residential status, education status, any previous knowledge regarding NSI and if yes source of information, except with

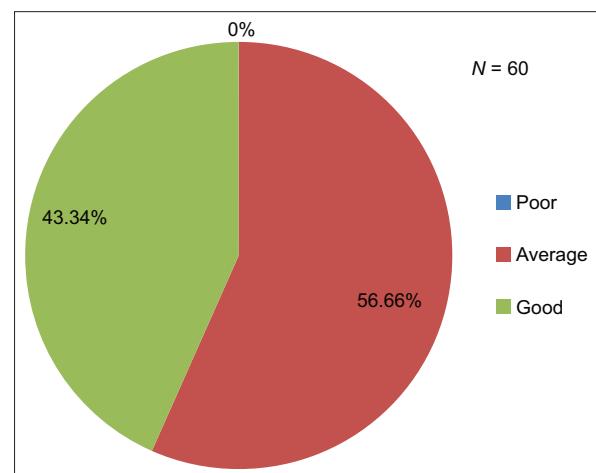
**Table 3: Findings related to comparison of mean pre-test and post-test knowledge score regarding needle stick injury and its post-exposure prophylaxis of HIV/AIDS**  
 $n=60$

Group	Mean	SD	SE Mean	df	$t$	$P$
Pre-test	12.34	3.65	35	59.	9.50	00**
Post-test	21.28	3.37	33			

\*\*Significant at  $P < 0.05$



**Figure 1:** (%) wise distribution of level of pre-test knowledge score regarding needle stick injury and its post-exposure prophylaxis of HIV/AIDS among nursing students



**Figure 2:** Percentage-wise distribution of level of post-test level of knowledge regarding needle stick injury and its post-exposure prophylaxis of HIV/AIDS



**Table 4: Findings related to association of pre-test knowledge score with selected demographic variables n=60**

Demographic variables	Level		$\chi^2$	Table Value	df	P
	Average	Good				
Age (in years)						
18-21	03	02	2.24	5.991	2	0.32 <sup>NS</sup>
22-25	26	16				
26-29	05	08				
Religion						
Hindu	34	26	--	--	--	--
Residential Status						
Urban	14	12	0.16	3.841	1	0.9 <sup>NS</sup>
Rural	20	14				
Education Status						
B.Sc Nursing	11	09	5.89	3.841	1	0.04 <sup>**</sup>
GNM	23	17				
Previous Knowledge						
Yes	09	14	2.56	3.841	1	0.27 <sup>NS</sup>
No	25	12				
If yes, source of information						
Mass Media	02	09	2.97	5.991	2	0.22 <sup>NS</sup>
Friends	02	01				
Books	05	04				

NS - Not significant. \*\*Significant at  $P < 0.05$ 

education status. Hence, the research hypothesis (H2) was partially accepted.

## Discussion

The result of present study shows that structured teaching program is effective in improving the level of knowledge in nursing students its post-exposure prophylaxis of HIV/AIDS among nursing students that is from mean pre-test knowledge score (12.34) to mean post-test knowledge score (21.28). The t value obtained was 9.50 at  $\leq 0.05$  was significant. Hence, it is inferred that the mean post-test was greater than mean pre-test score. These findings were consistent with the findings of similar study conducted by Richardson S (2017).<sup>[10,11]</sup> Where t value was 48.153 this indicates there are significant differences between pre-test and post-test knowledge score. Than pre-test mean score was 1.90 with standard deviation was 0.707. These score indicate that structured teaching program has improved their knowledge toward the needle stick injury and its post-exposure prophylaxis of HIV/AIDS among nursing students. The overall t value 48.153 is higher than critical table value indicates the enhancement in the mean score was found to be significant at 5% level for all aspects under the study. A present study result shows an association of knowledge regarding prevention of Needle Stick Injuries and its post-exposure prophylaxis of HIV/AIDS among nursing students with age, education status and previous knowledge. Another study conducted by Cervini P. and Bell C (2005)<sup>[11,12]</sup> shows significant relationship with the age, education status and previous knowledge regarding prevention of Needle Stick Injuries and its post-exposure prophylaxis of HIV/AIDS among nursing students.

## Conclusion

This study has shed light on the significant impact of organized educational campaigns in enhancing healthcare professionals' understanding of needle stick injuries (NSIs) and their knowledge regarding post-exposure HIV/AIDS prophylaxis. Through a structured educational intervention, we sought to address the knowledge gaps and misconceptions that can contribute to inadequate NSI management.

The results of this study point to a successful conclusion since the healthcare professionals who took part in the teaching programmes showed considerable improvements in their knowledge of NSIs and the right procedures for post-exposure prophylaxis. This is encouraging evidence that focused instructional programmes can make a significant contribution to improving healthcare workers' safety and lowering the risk of HIV transmission after NSIs. Recognizing the necessity of continuous educational initiatives and sporadic refresher courses is crucial for ensuring that the knowledge and awareness produced by these programmes are maintained throughout time. Future studies may also examine the cost-effectiveness of such educational activities as well as the long-term impacts of such initiatives on the occurrence of NSIs and the subsequent treatment of such conditions.

## Summary

This study highlights the need of coordinated educational programmes in the healthcare industry as a way to give healthcare personnel the information and abilities needed to properly respond to NSIs. By doing this, we may try to create a setting where healthcare professionals are in a safer working environment and where there is a lower chance of HIV transmission at medical facilities.

## Acknowledgement

The authors are very much thankful to all experts, authorities, respondents, statistician, librarian, previous researcher for their invaluable cooperation, suggestions which enabled us to put together this study.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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